

REMARKS

The applicants appreciate the Examiner's thorough examination of the application and request reexamination and reconsideration of the application in view of the preceding amendments and the following remarks.

The Examiner correctly acknowledges that the subject application is a continuation of U.S. Application Serial No. 10/225,872 filed August 22, 2003. However, the Examiner alleges that U.S. Application Serial No. 10/225,872 claims additional disclosure not present in U.S. Application Serial No. 09/873,625, and hence, U.S. Application Serial No. 10/225,872 should be considered a continuation-in-part application.

By definition, a continuation-in-part patent application is an application filed during the pendency of an earlier filed non-provisional application which adds new matter not disclosed in the earlier non-provisional application. *See* MPEP §201.08. The applicants respectfully disagree with the Examiner that U.S. Application Serial No. 10/225,872 adds additional disclosure not present in U.S. Application Serial No. 09/873,625. After careful review of the entire specifications of both the U.S. Application Serial No. 10/225,872 and the U.S. Application Serial No. 09/873,625 the applicants confirm that entire specifications of both applications are exactly the same.

Accordingly, U.S. Application Serial No. 10/225,872 is a proper continuation of U.S. 09/873,625. Accordingly, the Examiner's objection to the priority should be withdrawn. Because U.S. Application Serial No. 10/225,872 is a proper continuation application of U.S. Application Serial No 09/873,625, there is no need to revise the Related Applications Section of the specification as requested by the Examiner.

The Examiner rejects claim 91 under 35 U.S.C. §112, second paragraph as being indefinite. The Examiner indicates that on the second to last line of claim 91 "said fluid" is

vague and indefinite. As shown above under AMENDMENT A, the applicants have amended claim 91 to replace “said fluid overflow” with “said clear fluid overflow” as suggested by the Examiner.

The Examiner also alleges that the “recirculating means responsive to said clear fluid overflow from said sedimentation means for recirculating said fluid to said flocculation means” as recited in claim 91 needs to be discussed in the body of the specification. The aforementioned features in claim 91 are adequately disclosed in the applicants’ specification. As shown in Applicants’ specification, page 10, lines 5-10: “the recirculating means may include regeneration means for the regeneration of the magnetic seed. Regeneration means may include demagnetization means for demagnetizing the magnetic seed. The regeneration means may include drying means.” (emphasis added). The recirculation means and sedimentation means for the clear fluid overflow are also disclosed in the applicants’ specification on page 23, lines 6-page 24, line 3:

By recirculating magnetic seed 32, the amount of flocculant 34 required may be reduced. Further, less magnetic seed 32 is required and thus less space is required to maintain magnetic seed 32. Thus, regenerating magnetic seed decreases operation costs. Regeneration of seed 32 may be accomplished by diverting all or a portion of the recycled seed discharged from recirculation pump 90 through seed regeneration means 101.

In another embodiment, magnetic preconditioning means 12, Fig. 5, coagulation means 14', nucleation means 18', magnetic seeding means 30' and flocculation means 33' are the same as discussed above with reference to Fig. 4. However, separator means 36" includes sedimentation means 106, similar to that discussed in Fig. 3, instead of magnetic filtration. Separator pump means 66' feeds flocs 64' into sedimentation means 106 which may include settling tank 108.

As shown in Fig. 4 of the application, the recirculation means is clearly indicated by reference 88 and further disclosed in the applicants’ specification on page 22, lines 13-15 as follows:

Secondary magnetic filtration means 78 applies a high magnetic field with a flux density in the range of 0.1 to 2.0 Tesla and a field gradient of 1 to 1000 Tesla/meter to the sheared flocs to separate magnetic seed 32 from the sheared flocs. The recovered magnetic seed 32 is collected by seed collector 84 which includes seed collection tank 86. The collected magnetic seed 32 is then recirculated by recirculation means 88, which includes recirculation pump 90, which returns the magnetic seed 32 to magnetic seeding means 30'. (emphasis added).

Sedimentation means for re-circulating the fluid to the flocculation means is further disclosed in Applicants' specification on page 24, lines 5-10 and shown in Fig. 5.

Provided that flocculation 33' has formed large, loose flocs 64', the overflow of sedimentation means 106 is a clear fluid which overflows settling tank 108 into supplemental magnetic filtration means 110 which magnetically separates smaller flocs that may have been created by disturbances in the flow of flocs 64' into settling tank 108 from separator pump means 66' and, because of their small size, did not settle in sedimentation means 106. (emphasis added).

As shown above, there is sufficient support in the applicants' specification for "recirculating means responsive to said clear fluid overflow from said sedimentation means for recirculating said fluid to said flocculation means" as recited in claim 91. As shown above, these features are also clearly disclosed in Figs. 4 and 5. Accordingly, it is respectfully requested that the Examiner's objection to the above language in claim 91 and the Examiner's objection to the specification and drawings under 37 CFR 1.83(a) be withdrawn.

The Examiner rejects claims 2, 32, 71-84 and 86 under 35 U.S.C. 101 as claiming the same invention as that of Patent claims 24, 30, 65, 69-81, and 83, respectively, of U.S. Patent No. 6,099,738 to Wechsler *et al.* As shown above, the applicants have cancelled claims 2, 32, 71-84 and 86. Accordingly the Examiner's rejection of these claims is now moot.

The Examiner rejects claims 1, 3-31, 33-40, 43-49, 51-70, 85 and 87-89 under the judicially created doctrine of double patenting over patent claims 3-22, 24-29, 32-38, 42-54,

56-63, 65, 66, 82 and 84-87 of U.S. Patent No. 6,099,738 to Wechsler *et al.* since the claims, if allowed, would improperly extend the “right to exclude” already granted in the patent. Accordingly, the applicants submit herewith a Terminal Disclaimer to obviate the double patenting rejection and advance prosecution of the subject application. Accordingly, the Examiner’s rejection of claims 1, 3-31, 33-40, 43-49, 51-70, 85 and 87-89 should be withdrawn.

The Examiner also rejects claims 41, 42 and 50 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Patent claims 24 and 65 of U.S. Patent No. 6,099,738 to Wechsler *et al.* in view of Weiss *et al.* As stated above, the applicants submit herewith a Terminal Disclaimer to obviate the double patenting rejection and advance prosecution of the subject application. Accordingly, the applicants respectfully request that the rejection of obviousness-type double patenting of claims 41, 42 and 50 over Wechsler *et al.* in view of Weiss *et al.* be withdrawn. Moreover, as discussed in detail below, the applicants maintain that claims 41, 42 and 50 are not obvious over the claims of the '738 patent in view of Weiss *et al.* because Weiss *et al.*, either alone or in combination, does not teach, suggest, or disclose each and every element of the applicants’ invention as recited in independent claims 1, 43 and 90-92. Accordingly, because claims 41, 42 and 50 depend from allowable base claims, these claims are allowable and patentable under the judicially created doctrine of obviousness-type double patenting.

The Examiner rejects claims 1, 3, 4, 7, 11, 15, 19, 23-26, 28-30, 33-38, 41, 43-45, 50-52, 58, 59, 66-70, 85, 87, 89, 90 and 92 under 35 U.S.C. 102(b) as being anticipated by Weiss *et al.*

The applicants’ innovative method for removing a solute from a fluid includes the steps of 1) adding a coagulant to the fluid to transform a solute from a dissolved state to a

non-dissolved, particulate state forming colloids, and to destabilize the colloidal suspension of the particulates by reducing any charge on the surfaces of the particulates responsible for repulsion between them, 2) collecting the colloids for removal from the fluid including the steps of adding a magnetic seed to the fluid and adding a flocculant to the fluid to form flocs, 3) separating the flocs by sedimentation after flocculation has been completed to remove the flocs leaving a clear fluid overflow, and 4) magnetically filtering small flocs from the overflow.

In sharp contrast, Wechsel *et al.* teaches, suggests and discloses a particulate coagulant/adsorbent and method for preparing a particulate material such as mineral or clay. It is important that the Examiner understands there are distinct differences between Weiss *et al.* and the applicants' invention as recited in independent claims 1, 43, and 90-92 and that Weiss *et al.* has no relationship at all to the applicants' invention. Other than the fact that Weiss *et al.* teaches and discloses clarifies and magnetic separators as a convenient means for extracting settleable and magnetizable particles from a fluid strain, the physical and in particular the chemical aspects of the Weiss *et al.* and the applicants' invention as recited in claims 1, 43 and 90-92 are not similar at all. For example, Weiss *et al.* teaches, suggests, and discloses the use of coagulation followed by sand filtration: "current standard processes are incorporating coagulation followed by sand filtration" (col. 1, lines 23-26). Although Weiss *et al.* and the applicants' claimed invention as recited in independent claims 1, 43 and 90-92 use coagulants and magnetite, they are used in very different ways and in processes that are fundamentally different in both chemical and physical means by which contaminants in the water are removed. Weiss *et al.* teaches, suggests, and discloses adding a particular coagulant/adsorbent and method for preparing it wherein the particulate coagulant/adsorbent are defined as mineral or clay and less than 10 microns in size and treated to produce a thin

hydroxylated surface that has a positive zeta potential at the absorption pH. The hydroxylated surface is referred to as a “gel” and the particle has a gel particle. In one embodiment the mineral is magnetite.

Weiss *et al.* also teaches and discloses the specified use of the coagulant/adsorbent particle is in a process wherein the particles are co-mixed with the water to be treated (the “feed”). Contaminants adsorb on to the “gel” surface of the particles. The contaminant-laden particles are removed from the feed water via sedimentation. Contaminants are then released from the particles by raising the pH of the mix with caustic soda. The particles are magnetically separated from the contaminants. The surface of the particles is then regenerated and washed. Regenerated particles are recycled to the “feed”.

In contrast, the applicants’ invention as recited in claims 1, 43, and 90-92 process coagulant and untreated magnetite “seed” that is separately mixed with the feed water to be treated. A flocculent is then added to bind particulate contaminants to the “seed” in the form of “flocs”. The flocs are removed via sedimentation and magnetic separation. The seed is recovered via breaking the floc in a high shear mixer and magnetically separating the seed from the contaminants. There is no special treatment of the magnetite surface. There is no surface adsorption. Contaminants are released physically rather than chemically. There is no need to regenerate the surface of the magnetite.

The difference between Weiss and Applicants’ invention is clearly defined by Weiss *et al.* (col. 6, lines 57-69) and (col. 7, lines 1-5) wherein Weiss *et al.* describes the “striking difference in behavior when an untreated finely divided mineral particle (e.g., magnetite) is added to turbid water along with coagulant chemicals, compared to the gel particles of the invention”.

As described above, adding an untreated, finely divided mineral particle (e.g.,

magnetite) to turbid water along with coagulant chemicals defines the applicants' claimed method and system as recited in independent claims 1, 43 and 90-92 process. By Weiss' own definition his "invention" is clearly and deliberately different from Applicants' invention. Weiss goes to some length to emphasize this difference.

Weiss also teaches and discloses to "eliminate the use of a coagulant" by including the chemical function of a coagulant in the gel coating of the "coagulant/adsorbent particles". *See Col. 2, lines 19-24 of Weiss. Weiss does not use a magnetic seed.* Magnetite is instead used as the substrate for a gel surface formulated to adsorb impurities via a chemical reaction similar to that of a coagulant.

Weiss also teaches, suggest and discloses a new type of material for removing suspended impurities and color from water by coagulation and adsorption. *See Col. 1, lines 11-13.* The applicants' invention as recited in claims 1, 43, and 90-92 does not use "a particulate coagulant/adsorbent" and instead adds a coagulant to the fluid to transform a solute from a dissolved state to a non-dissolved, particulate state forming colloids, and to destabilize the colloidal suspension of the particulates by reducing any charge on the surfaces of the particulates responsible for repulsion between them.

As shown above, Weiss *et al.* does not teach, suggest or disclose each and every element of the applicants' invention as recited in independent claim 1, 43, and 90-92, namely, adding a coagulant (or means for adding the coagulant) to the fluid to coagulate the solute particles to form colloids the fluid by transforming a solute from a dissolved state to a non-dissolved, particulate state forming colloids into destabilized colloid suspension of the particulates by reducing any charge from the surfaces of the particulates responsible for repulsion between them, and collecting the colloids (or means for collecting) for removal from the fluid including the steps of adding a magnetic seed to the fluid and adding a

flocculant to the fluid to form flocs.

Accordingly, independent claims 1, 43, and 90-92 are allowable and patentable under 35 U.S.C. 102(b). Because dependent claims 3, 4, 7, 11, 15, 19, 23-26, 28-30, 33-38, 41, 43-45, 50-52, 58, 59, 66-70, 85, 87 and 89 depend from an allowable base claim, these claims are allowable and patentable under 35 U.S.C. 102(b).

The Examiner rejects claims 5, 6, 8-10, 12-14 and 16-18, 20-22, 31, 39, 40, 42, 46-49, 53-57, 60-65, 88 and 91 under 35 U.S.C. 103(a) as being unpatentable over Weiss *et al.*

As discussed above, Weiss *et al.* does not teach, suggest or disclose each and every element of the applicants' claimed invention as recited in independent claims 1, 43 and 90-92. Accordingly, the Examiner's rejection of claims 5, 6, 8-10, 12-14, 16-18, 20-22, 31, 39, 40, 42, 46-49, 53-57, 60-65, 88 and 91 under 35 U.S.C. 103(a) is traversed.

Each of the Examiner's rejections has been addressed or traversed. Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts at (781) 890-5678.

Respectfully submitted,



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